

Environmental and socioeconomic impact of organic coffee certification in Central America as compared with other certification seals¹

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Abstract

806 farmers were surveyed in Nicaragua, Costa Rica & Guatemala, using COSA® format to determine the socio economic and environmental impact of coffee certification. 40 farmers from each certification (organic, fair trade (FT), Rainforest Alliance (RA), CAFE Practices (CP) and Utz Certified) were interviewed and compared with 80 non-certified farmers on each country. Results showed better performance of environmental indicators (Carbon footprint) in organic farms. Economic impacts were affected by farm altitude and size. RA and CP certified farms were in general larger farms (> 10 has), with higher production costs and but higher productivity resulting in greater income per hectare. Utz, Organic and FT were smaller farms, with lower production costs and lower productivity. Guatemala did not show differences in certified vs conventional sales prices for any seal. Although organic farms had on average the best coffee price they had one of the lowest income due to low productivity.

Introduction

Coffee production is the major commercial activity in the Central American region among small landowners. Organic and Fair Trade coffee started in the region in the mid 1990's, with a peak during the coffee crisis (2001-2004) (Ponce 2004). Other certifications, such as Utz certified, Rainforest Alliance (RA) and CAFE Practices (CP) were also established in the region to improve farmers' socioeconomic conditions and environment protection. In spite of all the investment, the increase in the conventional coffee price has caused a decrease in the number of organic coffee farmers (Hagggar & Soto 2010). Farmers are stepping out of the activity, switching to conventional production systems. Previous studies have evaluated the impact of coffee certification on agricultural practices and environmental impacts in Costa Rica (Quispe 2007), and Nicaragua and Honduras (Giovannucci & Potts 2008). These studies have shown the

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positive environmental impact of organic farming. Based on farmers' perception, organic coffee lowest productivity is due to low investment, confusion between organic and abandoned coffee, and recent certification restrictions in chicken manure (a major source of nitrogen) (Haggar & Soto 2010). This research seeks to understand the impact of the different certifications in the environment and the well being of the coffee farmers in the region.

Materials and methods

806 farmers from Costa Rica, Nicaragua and Guatemala were surveyed by coffee technicians of ANACAFE in Guatemala, and CATIE researchers in Nicaragua and Costa Rica. Surveys covered topics such as production costs and productivity for the 2008-2009 harvest. The survey used was developed by COSA® and adapted to local conditions by the local coffee specialist from CATIE and CIRAD, France.

Results

There was a strong correlation between farm size and seal in Nicaragua and Guatemala, where larger farms (>10 has) were certified RA and CP, while small farms (< 3 has) were certified organic and fair trade, or no-certified ($p < 0.001$). Average Utz farms have more than 10 has in Guatemala and less than 10 has in Costa Rica and Nicaragua. In Costa Rica the size – certification relationship was not observed.

Environmental impacts. Different size farm's carbon footprint was calculated in Nicaragua and Costa Rica. Organic farms showed the smaller footprint compared with conventional and RA certified farms. In all cases 80 to 90% of the footprint is linked to the organic or synthetic nitrogen fertilizer and the N_2O emissions.

Table 1. Coffee farm carbon footprints under different certifications schemes in Nicaragua and Costa Rica (n = number of farms used for each analysis).

Country	Certification	Carbon footprint (kg CO ₂ e kg coffee cherries ⁻¹)	Farm size (ha)	n
Costa Rica	Rain Forest	0.38	1 to 11	22
Costa Rica	Organic	0.11	10 to 20	2
Nicaragua	Rain Forest	0.21	25 to 100	8
Nicaragua	Conventional	0.20	25 to 100	16
Nicaragua	Organic	0.05	< 5	23
Nicaragua	Conventional	0.13	< 5	29

Socio-economic impacts. Production costs: The main cost on all farms in Nicaragua was labour (Fig. 1), accounting for 50 to 55% of total cost, with the exception of organic and Utz, where labour cost represented 80% of the total cost. Little investment was observed in pesticides (including herbicides). The second main cost in all systems was fertilizers. These data include all costs related to the production,

including transportation and use of synthetic and organic fertilizers such as compost or chicken manure for organic farmers (Fig. 2).

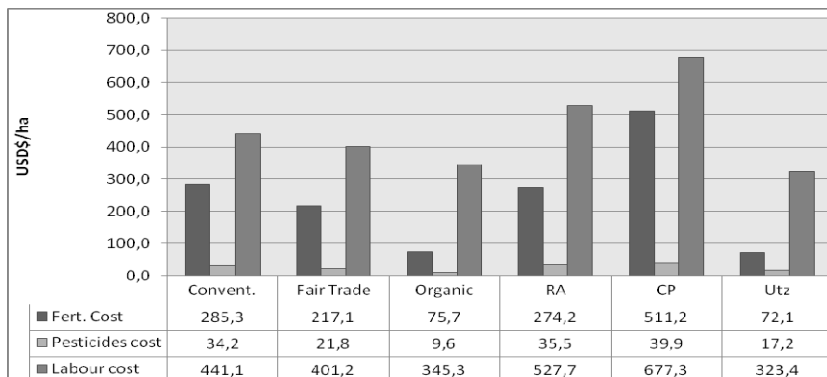


Fig.1. Fertilizer, pesticides and labour cost production for certified farmers in Nicaragua during the 2008-2009 harvest.

When compared the different certification systems, organic farmers are the ones that invest less on fertility management. The limited investment of organic farmers in fertilizers may be one of the reasons for its low productivity (488 kg/ha), as compared with CP in Nicaragua (1541 kg/ha) or RA (1035 kg/ha).

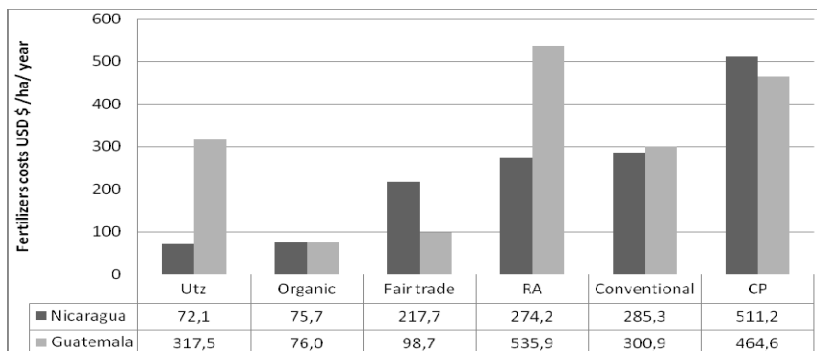


Fig. 2. Fertilizers costs (USD\$/ha) for conventional and certified coffee farms in Nicaragua and Guatemala (2008-2009), based on data provided by farmers.

Organic coffee sale prices per 46 Kg bag were higher in Costa Rica and Nicaragua than any other certification or conventional coffee price ($p > 0,001$). No statistical difference was observed in coffee prices among the different certifications in Guatemala (Fig 3). In Guatemala the Utz price was higher than in Costa Rica and Nicaragua. Utz price in Nicaragua was even lower than the conventional. The sample of Utz certified farms in Nicaragua was below the 800 masl, what could explain the lower sale price observed. Although organic farming has the higher market price in Nicaragua and Costa Rica, there was not statistic difference in profit when compared with conventional or fair trade coffee. This is due to the lower productivity of the

organic coffee in all countries. The most profitable systems were RA and CP in all three countries, probably directly related to farm size and investment capability.

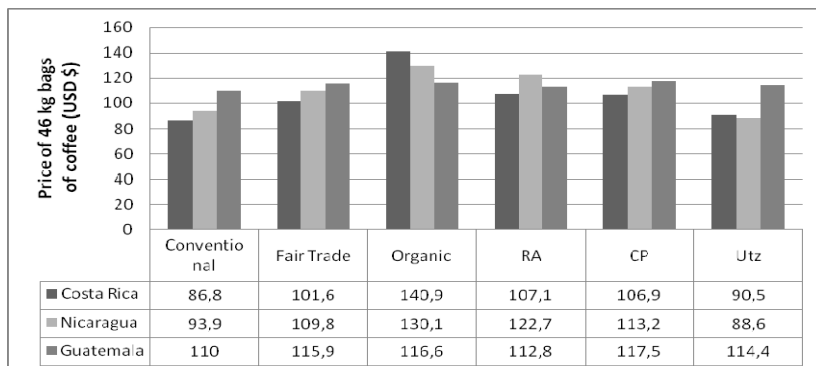


Fig. 3 Coffee prices received by farmers per 46 Kg bags of green certified and conventional coffee per country for the 2008-2009 harvest as informed by farmers.

Discussion

Larger, RA and CP certified farms have the highest profit in the region. Small farms with low investing capability can compensate for this situation with the higher prices of the organic coffee. However, when the conventional price is high, the premium cannot compensate for the differences in productivity. So it is vital to improve productivity in organic farms. This could be achieved with more scientific research, better training, but specially by improving the investing capability of these farmers.

Carbon Footprint in all organic farmers was lower than in conventional or RA certified farms due to the different sources of Nitrogen used.

Acknowledgments

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